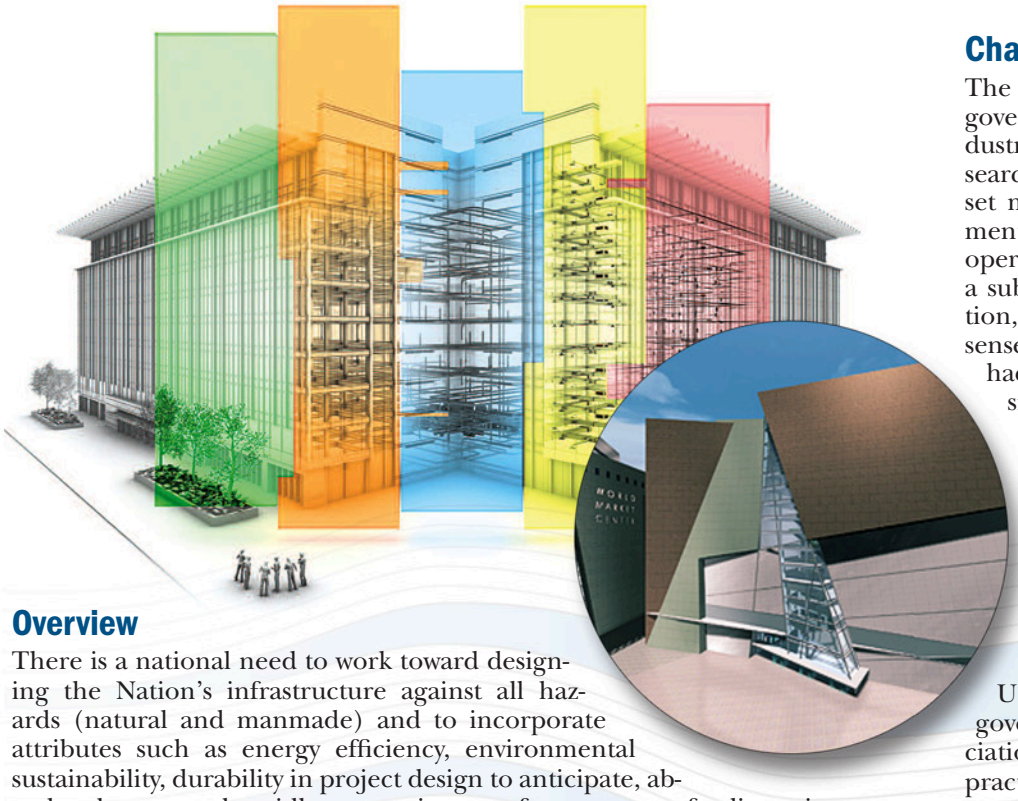
Integrating Resilience into Building Infrastructure Design



Overview

There is a national need to work toward designing the Nation's infrastructure against all hazards (natural and manmade) and to incorporate attributes such as energy efficiency, environmental sustainability, durability in project design to anticipate, absorb, adapt to, and rapidly recover in case of occurrence of a disruptive event. Within this framework, the U.S. Department of Homeland Security (DHS) Science and Technology (S&T) Infrastructure Protection and Disaster Management Division (IDD) is currently implementing the Integrating Resilience into Building Infrastructure Design, which is a flagship initiative of IDD.

Project Outputs

- Owners Performance Requirement Tool (OPR)
- Roadmap on national resilience and the protection of national key assets
- Second Annual Conference on Designing for a Resilient America to be held in December 2011
- Technical Committees for establishing metrics and benchmarks for high performance standards for all major building and infrastructure components. Committees include Architectural, Structural, Mechanical, Fenestration, and Risk and Uncertainties
- Advanced Materials Database (AMD) and Council
- Security Information and Technologies Exchange (SITE) Database and Council
- Journal of Advanced Materials (JMAT)

This project prescribes an integrated design that considers all hazards and a large range of building attributes that exceeds minimum requirements and thus expectations of the building community.

Challenges

The construction industry as a whole and the government agencies that work with this industry have made limited investments in research and development. Standards typically set minimum prescriptive life safety requirements (buildings may or may not continue operating after a disaster) that can be met by a substantial portion of the design, construction, and manufacturing community. In this sense, building owners and developers have had no compelling reasons to request designs or features that exceeded the minimum performance levels found in most U.S. codes and standards. However, our building stock continues to be vulnerable to explosives and other hazards as there are no codes and standards that clearly provide guidance to the design community to improve performance.

Users

Universities, researchers, state and local governments, code officials, industry, associations of engineers and architects, design practitioners, and standards development organizations. In addition DHS National Protection and Programs Directorate, Office of Infrastructure Protection, and Building and Infrastructure Sectors.

EISA 2007

The major capability of this project is to establish an overall resilience strategy that works towards the development of high performance materials and technologies that integrate and optimize high performance attributes included in the Energy Independence and Security Act (EISA) of 2007. This public law establishes an aggressive plan for achieving energy independence and other high performance attributes by the year of 2030. The positive attention surrounding this public law provides DHS with the opportunity to introduce blast resistance and security technologies into this nation's built environment over the next few years.

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Homeland Security
Science and Technology